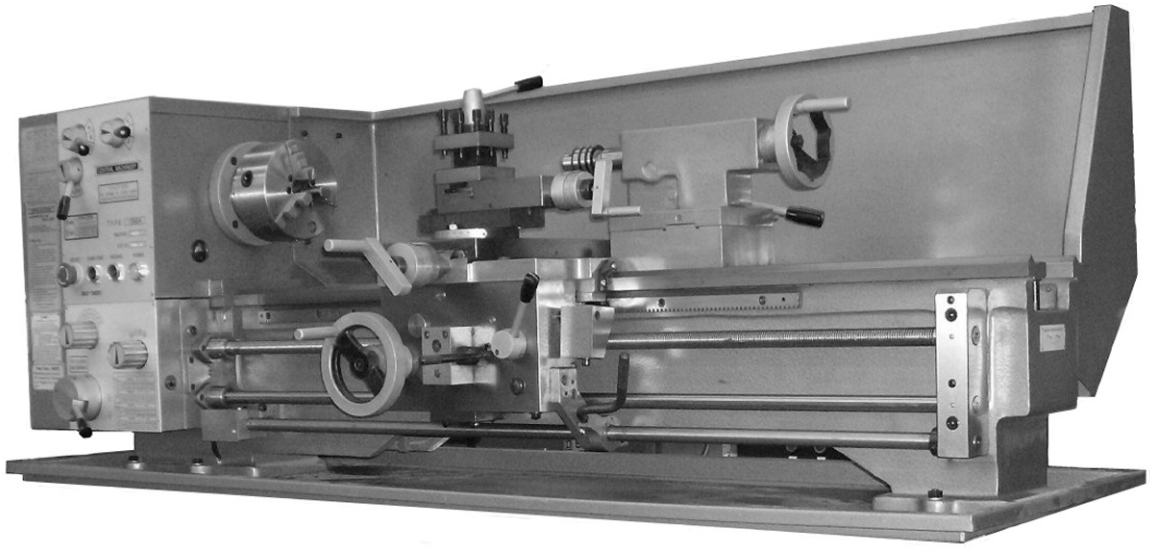
CENTRAL MACHINERY®

GEAR HEAD
GAP BED LATHE

Model 65044 66164

SET UP AND OPERATING INSTRUCTIONS



Unless noted otherwise, SKU 66164 - 13” x 40” Lathe - shown throughout this manual.

Visit our website at: http://www.harborfreight.com

Read this material before using this product. Failure to do so can result in serious injury. SAVE THIS MANUAL.

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For technical questions or replacement parts, please call 1-800-444-3353.

Revised Manual 10a

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SAVE THIS MANUAL

Keep this manual for the safety warnings and precautions, assembly, operating, inspection, maintenance and cleaning procedures. Write the product's serial number in the back of the manual near the assembly diagram (or month and year of purchase if product has no number). Keep this manual and the receipt in a safe and dry place for future reference.

IMPORTANT SAFETY INFORMATION

In this manual, on the labeling, and all other information provided with this product:

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠DANGER **DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.**

⚠WARNING **WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.**

⚠CAUTION **CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.**

NOTICE **NOTICE is used to address practices not related to personal injury.**

CAUTION **CAUTION, without the safety alert symbol, is used to address practices not related to personal injury.**

General Tool Safety Warnings

WARNING Read all safety warnings and instructions. *Failure to follow the warnings and instructions may result in electric shock, fire and/or serious injury.* **Save all warnings and instructions for future reference.**

1. KEEP GUARDS IN PLACE and in working order.
2. REMOVE ADJUSTING KEYS AND WRENCHES. Form habit of checking to see that keys and adjusting wrenches are removed from tool before turning it on.
3. KEEP WORK AREA CLEAN. Cluttered areas and benches invite accidents.
4. DON'T USE IN DANGEROUS ENVIRONMENT. Don't use power tools in damp or wet locations, or expose them to rain. Keep work area well lighted.
5. KEEP CHILDREN AWAY. All visitors should be kept safe distance from work area.
6. MAKE WORKSHOP KID PROOF with padlocks, master switches, or by removing starter keys.

7. DON'T FORCE TOOL. It will do the job better and safer at the rate for which it was designed.

8. USE RIGHT TOOL. Don't force tool or attachment to do a job for which it was not designed.

RECOMMENDED MINIMUM WIRE GAUGE FOR EXTENSION CORDS (240 VOLT)				
NAMEPLATE AMPERES (at full load)	EXTENSION CORD LENGTH			
	50'	100'	200'	300'
0 – 6	18	16	16	14
6.1 – 10	18	16	14	12
10.1 – 12	16	16	14	12
12.1 – 16	14	12	Do not use.	
TABLE A				

9. USE PROPER EXTENSION CORD. Make sure your extension cord is in good condition. When using an extension cord, be sure to use one heavy enough to carry the current your product will draw. An undersized cord will cause a drop in line voltage resulting in loss of power and overheating. Table A shows the correct size to use depending on cord length and nameplate ampere rating. If in doubt, use the next heavier gage. The smaller the gage number, the heavier the cord.

10. WEAR PROPER APPAREL. Do not wear loose clothing, gloves, neckties, rings, bracelets, or other jewelry which may get caught in moving parts. Nonslip footwear is recommended. Wear protective hair covering to contain long hair.

11. ALWAYS USE SAFETY GLASSES. Also use face or dust mask if cutting operation is dusty. Everyday eyeglasses only have impact resistant lenses, they are NOT safety glasses.

12. SECURE WORK. Use clamps or a vise to hold work when practical. It's safer than using your hand and it frees both hands to operate tool.

13. DON'T OVERREACH. Keep proper footing and balance at all times.

14. MAINTAIN TOOLS WITH CARE. Keep tools sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.

15. DISCONNECT TOOLS before servicing; when changing accessories, such as blades, bits, cutters, and the like.

16. REDUCE THE RISK OF UNINTENTIONAL STARTING. Make sure switch is in off position before plugging in.

17. USE RECOMMENDED ACCESSORIES. Consult the owner's manual for recommended accessories. The use of improper accessories may cause risk of injury to persons.

18. NEVER STAND ON TOOL. Serious injury could occur if the tool is tipped or if the cutting tool is unintentionally contacted.

19. CHECK DAMAGED PARTS. Before further use of the tool, a guard or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function – check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard

or other part that is damaged should be properly repaired or replaced.

20. DIRECTION OF FEED. Feed work into a blade or cutter against the direction of rotation of the blade or cutter only.

21. NEVER LEAVE TOOL RUNNING UNATTENDED. TURN POWER OFF. Don't leave tool until it comes to a complete stop.

Lathe Safety Warnings

For Your Own Safety Read Instruction Manual Before Operating Lathe

1. Wear eye protection.

2. Do not wear gloves, necktie, or loose clothing.

3. Tighten all locks before operating.

4. The use of accessories or attachments not recommended by the manufacturer may result in a risk of injury to persons.

5. When servicing use only identical replacement parts.

6. Only use safety equipment that has been approved by an appropriate standards agency. Unapproved safety equipment may not provide adequate protection. Eye protection must be ANSI-approved and breathing protection must be NIOSH-approved for the specific hazards in the work area.

7. Industrial applications must follow OSHA guidelines.

8. Maintain labels and nameplates on the tool. These carry important safety information. If unreadable or missing, contact Harbor Freight Tools for a replacement.

9. Avoid unintentional starting. Prepare to begin work before turning on the tool.

10. People with pacemakers should consult their physician(s) before use. Electromagnetic fields in close proximity to heart pacemaker could cause pacemaker interference or pacemaker failure. In addition, people with pacemakers should:
    • Avoid operating alone.
    • Do not use with power switch locked on.
    • Properly maintain and inspect to avoid electrical shock.
    • Any power cord must be properly grounded. Ground Fault Circuit Interrupter (GFCI) should also be implemented – it prevents sustained electrical shock.

11. Some dust created by power sanding, sawing, grinding, drilling, and other construction activities, contains chemicals known [to the State of California] to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:
    • Lead from lead-based paints
    • Crystalline silica from bricks and cement or other masonry products
    • Arsenic and chromium from chemically treated lumber
    Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic

particles. (California Health & Safety Code § 25249.5, *et seq.*)

12. WARNING: Handling the cord on this product will expose you to lead, a chemical known to the State of California to cause cancer, and birth defects or other reproductive harm. Wash hands after handling. (California Health & Safety Code § 25249.5, *et seq.*)

13. The warnings, precautions, and instructions discussed in this instruction manual cannot cover all possible conditions and situations that may occur. It must be understood by the operator that common sense and caution are factors which cannot be built into this product, but must be supplied by the operator.

Vibration Safety

This tool vibrates during use. Repeated or long-term exposure to vibration may cause temporary or permanent physical injury, particularly to the hands, arms and shoulders. To reduce the risk of vibration-related injury:

1. Anyone using vibrating tools regularly or for an extended period should first be examined by a doctor and then have regular medical check-ups to ensure medical problems are not being caused or worsened from use. Pregnant women or people who have impaired blood circulation to the hand, past hand injuries, nervous system disorders, diabetes, or Raynaud's Disease should not use this tool. If you feel any medical or physical symptoms related to vibration (such as tingling, numbness, and white or blue fingers), seek medical advice as soon as possible.

2. Do not smoke during use. Nicotine reduces the blood supply to the hands and fingers, increasing the risk of vibration-related injury.

3. Wear suitable gloves to reduce the vibration effects on the user.

4. Use tools with the lowest vibration when there is a choice between different processes.

5. Include vibration-free periods each day of work.

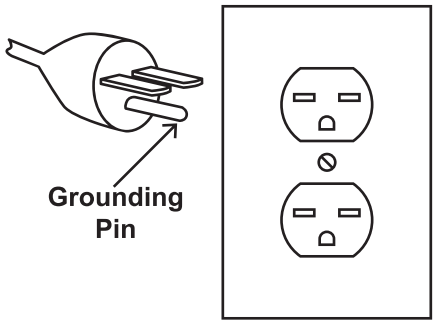
6. Grip tool as lightly as possible (while still keeping safe control of it). Let the tool do the work.

7. To reduce vibration, maintain the tool as explained in this manual. If any abnormal vibration occurs, stop use immediately.

SAVE THESE INSTRUCTIONS.

GROUNDING INSTRUCTIONS

WARNING **TO PREVENT ELECTRIC SHOCK AND DEATH FROM INCORRECT GROUNDING WIRE CONNECTION READ AND FOLLOW THESE INSTRUCTIONS:**



250 V~ 3-Prong Plug and Outlet
(for up to 250 V~ and up to 15 A)

1. This tool is intended for use on a circuit that has an outlet that looks like the one illustrated above in **250 V~ 3-Prong Plug and Outlet**. The tool has a grounding plug that looks like the plug illustrated above in **250 V~ 3-Prong Plug and Outlet**. Make sure the tool is connected to an outlet having the same configuration as the plug. No adapter is available or should be used with this tool. If the tool must be reconnected for use on a different type of electric circuit, the reconnection should be made by qualified service personnel; and after reconnection, the tool should comply with all local codes and ordinances.
2. The 250 V~ plug does not come pre-installed and will need to be installed by a certified electrician.
3. The plug above is for use on a 15 A circuit. A different 250 V~ plug and outlet combination may be used, provided it is rated to handle the electrical requirements of the tool and is installed by a certified electrician.

125 V~ REWIRING

1. Only a qualified electrician should rewire this lathe to operate on 125 V~ power.
2. Refer to Wiring Diagrams at end of manual.

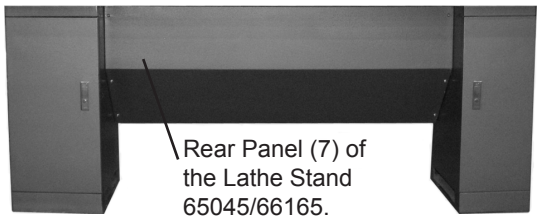
SPECIFICATIONS

Model	65044	66164
Electrical Requirements	110/220 V~ ; 60 Hz ; 17/8.5 A Pre-Wired to 220 V~	
Fuses	Fast Acting 2 A (Left) Fast Acting 1 A (Right)	
Lathe Type	Metal Working	
Motor Speed	1720 RPM	
Spindle Speeds	60 to 1550 RPM (18 Speed)	
Spindle Taper	MT-5	
Spindle Bore	1-1/2”	
Drive Method	V-Belts and Pulleys	
V-Belt Markings	B787 L1827 2007-01 (0) 1235-133	
Swing Over Bed	12”	13”
Swing Over Gap	18-1/2”	16-1/4”
Center to Center	36”	40-3/4”
Tool Slide Travel	3-1/2”	3”
Tailstock Quill Travel	3-3/4”	4”
Tailstock Quill Taper	MT-3	
Threading Capacity	Inch = 40 Metric = 29	Inch = 32 Metric = 22
Tool Post Capacity	3/4”	1”
Tool Post Style	4-Way	
Mounting Holes	Headstock: 3/8” Diameter (Qty. 4) Tailstock: 3/8” Diameter (Qty. 2)	

65044 ACCESSORIES

Description	Qty.
Hex Key Set (3, 4, 5, 6, 8, 10 mm)	1
Tool Box	1
Oil Dropper	1
Exterior Clamping Chuck Jaws (3 pc set)	1
Gear Set	1
Faceplate	1
Slotted Screwdriver	1
Phillips Screwdriver	1
#3 Dead Center	2
#3 Liver Center	1
Drill Chuck and Adapter	1
Tool Post Wrench	1
8” 4-jaw Chuck with Wrench	1
8” 4-jaw Chuck with Wrench	1

Note: Lathe Stand (either sku 65045 or 66165) is designed for use with these Gear Head Gap Bed Lathes (both sku 65044 and 66164). For shipping efficiency, Rear Panel of the Lathe Stand is packed with this Lathe.



66164 ACCESSORIES

Description	Qty.
3-Jaw Chuck (Installed on Lathe)	1
4-Jaw Independent Chuck	1
Center Rest (Installed on Lathe)	1
Follow Rest (Installed on Lathe)	1
Face Plate	1
Tool Box	1
L-Style Hex Key Set (10, 8, 6, 5, 4, 3, 2.5, 2, and 1.5 mm)	1
Center Sleeve with #5 Exterior Morse Taper & #3 Interior Morse Taper	1
#3 Live Center Morse Taper	1
#3 Dead Center Morse Taper	1
Exterior Clamping Chuck Jaw	3
Pressure Oil Gun	1
T-Handle Chuck Key	2
L-Style Chuck Key	1
Double-Ended 8mm & 10mm Wrench	1
Double-Ended 12mm & 14mm Wrench	1
Double-Ended 17mm & 19mm Wrench	1
T-Handle Female 10mm Square Drive	1
Adjustable Wrench	1
Phillips Head Screwdriver	1
Slot Head Screwdriver	1
25-Tooth Gear	2
49-Tooth Gear	1
71-Tooth Gear	1

UNPACKING

When unpacking, check to make sure that the item is intact and undamaged. If any parts are missing or broken, please call Harbor Freight Tools at the number shown on the cover of this manual as soon as possible.

The unpainted surfaces of the Lathe are coated with a waxy oil to protect them from corrosion during shipment. Remove the coating with a solvent cleaner or citrus-based degreaser. Avoid chlorine-based solvents since they will damage the paint.

Note: For additional information regarding the parts listed in the following pages, refer to the Assembly Diagrams near the end of this manual.

HOISTING & INSTALLATION

Read the ENTIRE IMPORTANT SAFETY INFORMATION section at the beginning of this manual including all text under subheadings therein before set up or use of this product.

NOTE: This Lathe is about 1,058 lb. Hoisting and installation will require additional personnel and a proper lifting device.

1. Designate a work area that has a clean, dry, well-lit, flat, and level *floor surface* capable of supporting the Lathe, stand, workpieces, and any additional tools and equipment. The work area must not allow access by children or pets to prevent injury and distraction.

2. The Lathe will need to be located on a stand, or workbench, capable of bearing the combined weight of the Lathe and intended workpieces. The surface must be able to withstand the vibration generated by the Lathe during operation.

3. Bolt the stand to the floor before placing the Lathe on the stand.

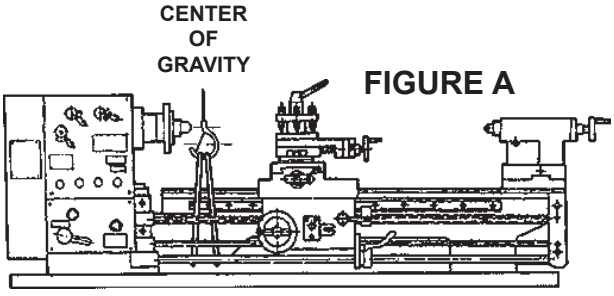


FIGURE A

4. If you will hoist the Lathe with a single point hoist, observe the center of gravity. To prevent damage, do not place lifting straps across the Slides. **(See Figure A.)**

5. Raise the Lathe slightly up from the floor surface, making sure the Lathe is properly balanced. Then remove the six Screws (5D), Washers (9D), and Nuts (10D) which secure the Lathe to its Chip Pan (8D).

6. Set the Chip Pan upon the stand. Use the six mounting holes in the Chip Pan as a template to mark the locations where six 3/8" diameter holes will be drilled into the stand. Temporarily remove the Chip Pan from the stand. Then drill the six 3/8" holes in the stand. Check to make sure no obstructions are in the drilling path.

7. Set the Chip Pan (8D) back onto the stand, aligning its six mounting holes with the six previously drilled holes in the stand. Lift and lower the Lathe onto the Chip Pan, aligning its six mounting holes with the six holes in the Chip Pan and stand.

8. Use six 3/8" diameter Screws of appropriate length with Washers and Nuts (none included) to secure the Lathe and Chip Pan (8D) to the stand.

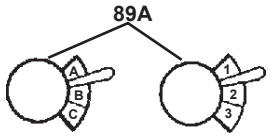
9. The Lathe must be completely level, left-to-right **and** front-to-back, or the Lathe will not rotate properly and may become damaged. If necessary, loosen the 3/8" diameter mounting Screws and use angled iron levelers (not included) to level the Lathe. Tighten the Screws.

10. Route the Power Cord to reach the work area without creating a tripping hazard or exposing the power cord to possible damage.

PRODUCT FEATURES & OPERATING GUIDE

Note: Refer to Figure C for control locations.

FIGURE B



Spindle Speed Chart						
60 Hz	I			II		
	1	2	3	1	2	3
A	320	1550	950	220	1150	700
B	90	430	260	60	300	200
C	240	1200	725	180	890	525

Spindle Speed Chart				
		1	2	3
A	60 Hz	270	1400	800
	50 Hz	250	1500	850
B	60 Hz	75	360	220
	50 Hz	50	325	200
C	60 Hz	200	1000	600
	50 Hz	150	950	540

1. **Shifter Controls (89A):** The Spindle speed can be controlled by setting the two Shifter Controls. Refer to the Chart on the Headstock to determine the proper setting for the desired Spindle rotation speed (18 or 9 step speeds from 60 to 1550 RPM). **Do not change the settings of these controls when the Motor is running. (See Figure B.)**

2. **Lead/Feed Lever (100A):** The Lead/Feed Lever is used to change the direction of either the longitudinal or cross feeds.

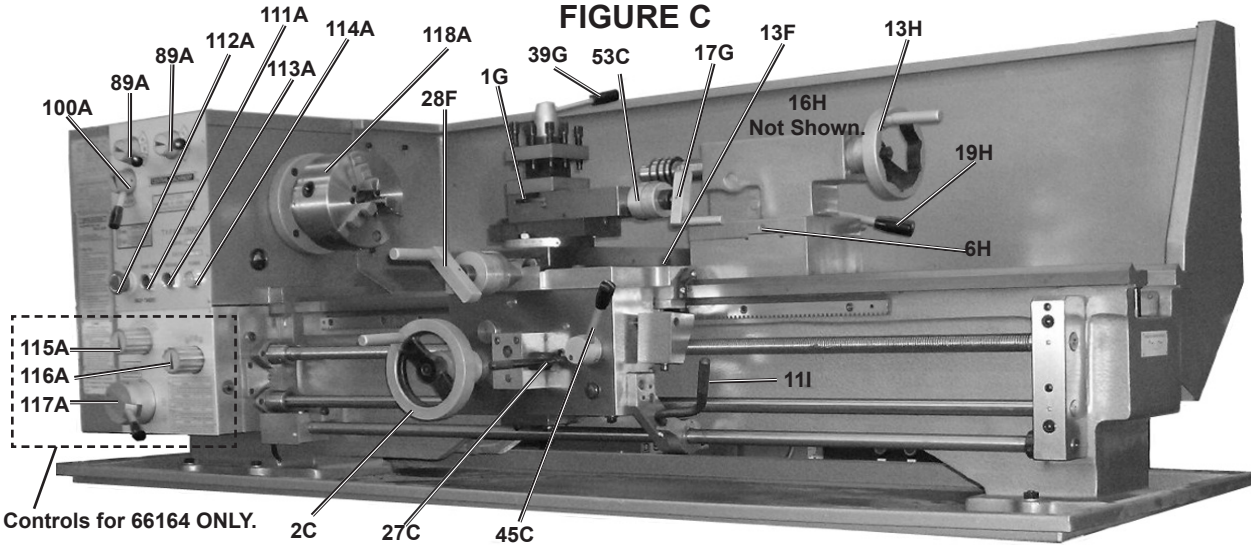
3. **Starting Handle (11I):** The Starting Handle Locks in the center location; move it to the right to unlock it. For a clockwise rotation, move the Spindle Handle down. For a counterclockwise rotation, move the Spindle Handle up. With the Handle in the middle position, the Spindle will not rotate.

4. **Power Switch (111A):** The Power Switch will power the Motor and start the Spindle turning if the Starting Handle (11I) is in the down or up position.

5. **Emergency Stop (112A):** Turn the Emergency Stop clockwise and the Indicator Light (114A) will illuminate, showing that the lathe is powered. The Spindle will not turn without operating the Starting Handle (11I). In an emergency, you can stop the machine by pressing the Emergency Stop.

6. **Inching Switch (113A):** The Inching Switch is used to rotate the Spindle only slightly in small increments.

FIGURE C



7. **Hand Wheel (2C):** The Hand Wheel is used to manually move the Apron Case (65C) along the Lathe Bed (1D).

8. **Thread Lever (45C):** The Thread Lever is used to engage the Half Nuts (56C, 57C) when threading.

9. **Cross Feed Crank (28F):** The Cross Feed Crank is used to manually move the Slide Plate (18F) in or out.

10. **Compound Slide Crank (17G):** The Compound Slide Crank is used to manually move the Tool Post (35G). The Compound Slide Crank is fully adjustable to any angle and is also used for threading or machining an angle on the workpiece.

11. **Feed Lever (27C):** The Feed Lever is used to engage either the longitudinal feed or cross feed. This Lever has a safety interlock to prevent accidental engagement of the Half Nuts (56C, 57C) when the Lathe is in the feed mode. There are three positions:
    - The center or disengaged position.
    - The upper position engages the power longitudinal feed.
    - The lower position engages the power cross feed.

12. **Thread Cutting Dial (53C):** The Thread Cutting Dial is used to engage the Half Nuts (56C, 57C) with the leadscrew in the same thread that has been previously cut. Use any line of the Dial for *even* pitches of threads, but you must use the same starting line for *odd* pitches of threads. (i.e., when cutting a shaft with 10 T.P.I., engage the Half Nuts (56C, 57C) at any number on the Thread Cutting Dial. When cutting odd pitches, if you start the cut using a “1” or a “3” continue using the “1” or the “3” until the thread is finished.)

13. **Clamp Lever (39G):** The Clamp Lever is used to tighten the Tool Post (35G) in place. Loosen the Lever, and the Tool Post can be rotated counterclockwise to change cutting tools.

14. **Saddle Lock Screw (13F):** The Saddle Lock Screw is used to firmly clamp the Saddle (1F) to the Lathe Bed (1D).

15. **Compound Slide Screw (1G):** The Compound Slide Screw is used to clamp the Compound Slide (3G) to the Saddle (1F).

16. **Hand Wheel (13H):** The Hand Wheel is used to feed or retract the Quill (3H). Turning the Hand Wheel counterclockwise until a full stop is reached will automatically eject the tool being used.

17. **Tailstock Clamp Lever (19H):** The Tailstock Clamp Lever locks the Tailstock (4H) to the Lathe Bed (1D). To lock, move the Lever up. To release, move the Lever down.

18. **Quill Lock Lever (16H):** The Quill Lock Lever prevents the Quill (3H) from moving. Before operating the Hand Wheel (13H), release the Lever. Feed the Quill to the desired position. Then lock the Quill Lock Lever.

19. **Chucks (118A , 119A) and Faceplate (110-1A):** Chucks and Faceplates are mounted on the Arbor Shaft (49A) using a threaded connection.

a. Open the Gear Box Cover (120A), and using a suitable wrench, hold the Arbor Shaft to prevent it from turning. Grip the Chuck or Faceplate, and rotate it in a counterclockwise direction to unthread it from the Arbor Shaft.

b. When re-installing a Chuck or Faceplate, be sure to put light grease on the threaded end of the Arbor Shaft to ease installation and removal of the Chuck or Faceplate.

c. You are provided with a 3-Jaw Chuck (118A) and a 4-Jaw Chuck (119A). Each may be used to hold workpieces by clamping from the outside, or by expanding on the inside of tubes and hollow pieces. To tighten the Jaws, rotate any of the internal Hex Head Bolts in the side of the Chuck with an appropriate size Hex Wrench. Chucks are self-centering, and will align concentric workpieces with the axis of rotation of the Arbor Shaft.

d. Faceplates (110-1A) are used typically to hold larger or non-round workpieces. Workpieces may be attached to the Faceplate by a variety of methods including clamps, bolts, and screws. It is critical that the centerpoint of the workpiece be exactly aligned with the center of rotation of the Arbor Shaft for accurate turning.

66164 Exclusive Controls

1. **Feed Gear Levers (115A) and (116A):** To change either of the Feed Gear Levers (115A, 116A), you must first unlock the Thread/Feed Selector (117A). These Feed Gear Levers are for selecting threading or feed. *Feed Gear Lever (115A)* features four positions. "G" and "E" positions are to adjust the Feeding Rod. "F" and "D" are to adjust the Lead Screw. *Feed Gear Lever (116A)* features eight positions. You can change the position of both Levers to provide various feeding rates and thread ranges. **Stop the Spindle before engaging either of these Levers.**
(See Figures D and E.)

FIGURE D

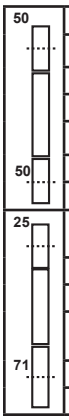
Change Gear Chart For mm Size

Combinations Or Gears			Position	mm Per Pitch							
F		G		1	2	3	4	5	6	7	8
25	Any	71	D	2.25	2		1.75		1.5	1.375	1.25
			F	0.55	0.5		0.45	0.4		0.35	
49	Any	71	D				3.5				2.5
			F					0.8			
50	Any	71	D	4.5	4	3.75		3.25	3	2.75	
			F		1		0.9				

Change Gear Chart For Inch Size

Combinations Or Gears			Position	TPI							
F		G		1	2	3	4	5	6	7	8
50	Any	50	D	4	4-1/2	4-3/4	5	5-1/2	6	6-1/2	7
			F	16	18	19	20	22	24	26	28
25	Any	50	D	8	9	9-1/2	10	11	12	13	14
			F	32	36	38	40	44	48	52	56

FIGURE E



	1	2	3	4	5	6	7	8
FEEDING—inch/								
G	0.0078	0.0069	0.0066	0.0062	0.0057	0.0052	0.0048	0.0046
E	0.0311	0.0277	0.0282	0.0249	0.0226	0.0207	0.0191	0.0178
FEEDING—mm/								
G	0.197	0.176	0.166	0.158	0.144	0.131	0.121	0.113
E	0.790	0.704	0.665	0.632	0.574	0.526	0.485	0.452
FEEDING—inch/								
G	0.0027	0.0024	0.0023	0.0022	0.0020	0.0018	0.0017	0.0016
E	0.0110	0.0098	0.0082	0.0088	0.0080	0.0073	0.0067	0.0063
FEEDING—mm/								
G	0.070	0.062	0.058	0.056	0.051	0.046	0.043	0.040
E	0.278	0.248	0.232	0.223	0.202	0.185	0.171	0.158

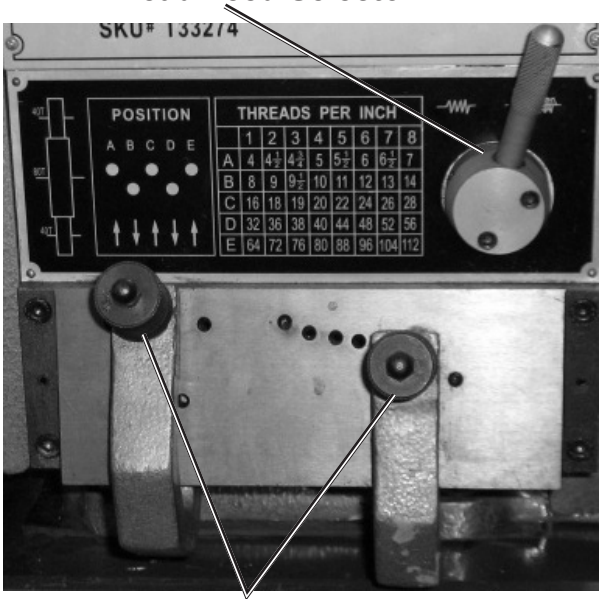
2. **Thread/Feed Selector (117A):** To change either of the Feed Gear Levers (115A, 116A), you must first unlock the Thread/Feed Selector (117A). After adjusting the Feed Selectors, lock the Thread/Feed Selector. **Stop the Spindle before engaging this Selector.**

65044 Exclusive Controls

CAUTION: To prevent damage:

Stop the spindle before adjusting the controls.

Thread/Feed Selector



Feed Rate Levers

1. Use Thread/Feed Selector to select threading or feeding. Position the Lead / Feed Lever (100A) to the Left for feeding. Center position is neutral. Right position is for lead screw.

2. Feed Rate Levers, control the feed gear box. The left Lever has five positions which are identified Alphabetically. The right Lever has eight positions which are identified Numerically.

3. Different settings of the two levers can provide various feed rates. The Feed Rate Chart is mounted on the left side of the Headstock.

4. Feed Rate Levers are also used to control the feed rate for various thread pitches. Both an SAE and a Metric Thread Pitch chart are mounted on the front of the Headstock.

STARTING

Before starting the Lathe:

1. Check and adjust Drive Belt (121A) tension. See "*Maintenance & Service*" section.
2. Make sure the lathe is properly lubricated.
3. Make sure the Lathe has sufficient oil. **During operation, if the oil level falls below the red line on the oil gauge, immediately stop machining and add oil until the level is at the red line.**
4. Make sure all levers and controls are tight and in the proper position.
5. Turn the Emergency Switch (112A) clockwise. Then press the Power Switch (11A) to start the Lathe.

MAINTENANCE AND SERVICE

Procedures not specifically explained in this manual must be performed only by a qualified technician.

⚠WARNING TO PREVENT SERIOUS INJURY FROM ACCIDENTAL OPERATION:
Turn the Power Switch (111A) of the Lathe to its "OFF" position and unplug the tool from its electrical outlet before performing any inspection, maintenance, or cleaning procedures.

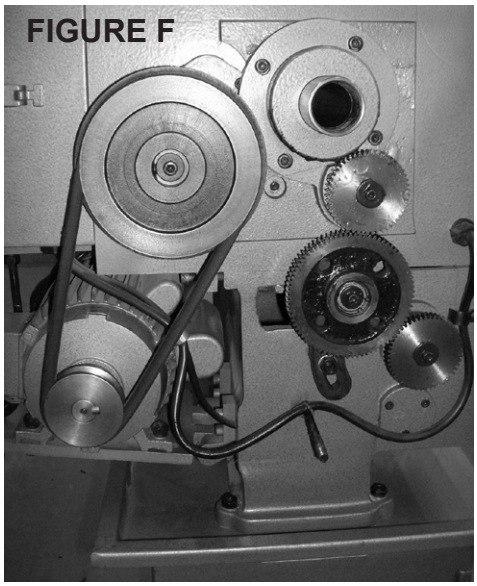
TO PREVENT SERIOUS INJURY FROM TOOL FAILURE:
Do not use damaged equipment. If abnormal noise or vibration occurs, have the problem corrected before further use.

1. BEFORE EACH USE, inspect the general condition of the Lathe. Check for loose screws, misalignment or binding of moving parts, cracked or broken parts, damaged electrical wiring, and any other condition that may affect its safe operation.

2. DRIVE BELT TENSION: The Motor and Drive Belt (121A) are installed and adjusted by the manufacturer. However, check the adjustment before first operating the Lathe and periodically thereafter.

   a. Check the Drive Belt tension by pressing in the middle with your finger. You should be able to depress the Drive Belt approximately 1/2 inch. If the Belt is too tight, it will wear the Bearings. If it is too loose, it will slip on the Pulleys and wear out prematurely.

FIGURE F



   b. Adjust the Drive Belt tension by adjusting the Bolt and Lock Nut assembly on the underside of the Motor. **(See Figure F.)**

3. LUBRICATION:

   a. Lubricate the Headstock Gears with No. 70 (HL-7) Gear Compound. Check the Gears periodically, and apply lubrication whenever they appear dry. Do not apply excessive grease, to avoid getting grease on the Drive Belt (121A). **(See Figure F.)**

   b. Change the oil in the Headstock regularly. When the machine is new, change the oil after the first 15 days of use. Change it again after the next 45 days of use. Thereafter, change the oil after each 6 months. To change the oil, open the Drain Plug on the underside of the Headstock. After draining, replace the Drain Plug and refill with clean

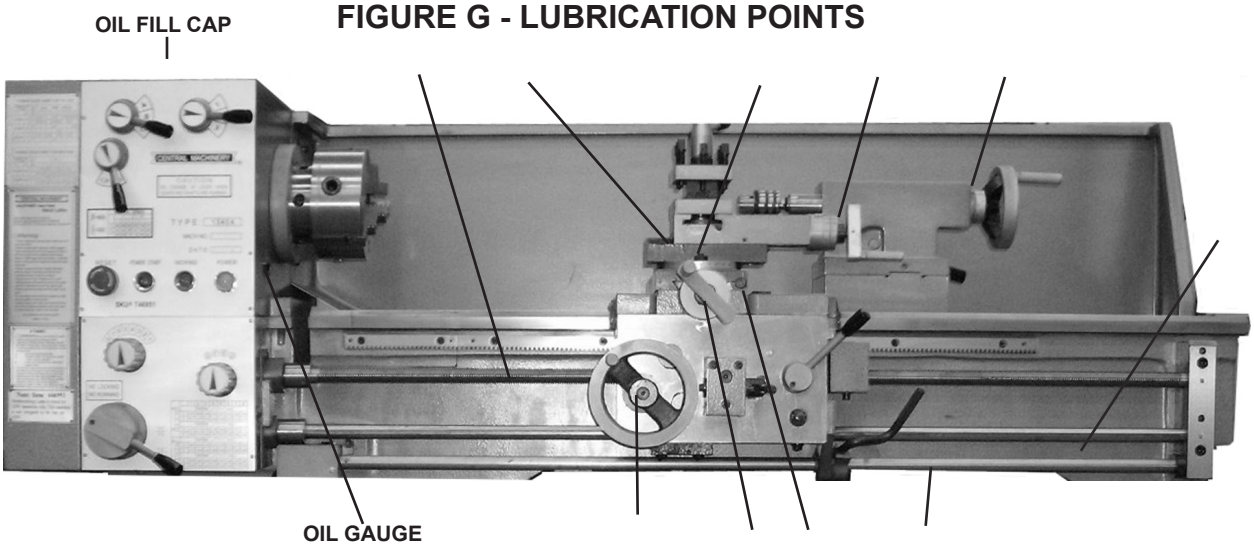
lubricating oil (30 weight) through the Oil Fill Cap until the oil level is at the red line on the Oil Gauge. Dispose of waste oil properly, and in accordance with local regulations. **If during operation the oil is below the red line, immediately stop machining and add oil until the level is at the red line.**
(See Figure G.)

c. Refer to the following illustration for instructions on overall lubrication of the Lathe. Check before each use to ensure the machine is properly lubricated. **(See Figure G.)**

4. AFTER USE, clean external surfaces of the tool with a clean cloth.

⚠**WARNING!** If the Power Cord (111A) of this Lathe is damaged, it must be replaced only by a qualified service technician.

FIGURE G - LUBRICATION POINTS



TROUBLESHOOTING

Problem	Possible Cause	Possible Solution
Quality of cut is poor.	1. Cutting tool is above workpiece center line. 2. Lathe speed too slow. 3. Cutting tool is dull. 4. Cutting too aggressively.	1. Lower cutting tool to center line of workpiece. 2. Increase lathe speed. 3. Sharpen or replace cutting tool. 4. Use a lighter touch.
Excessive vibration when turning thin workpieces.	1. Cutting tool is positioned below workpiece center line. 2. Cutting too aggressively.	1. Raise cutting tool to center line of workpiece. 2. Use a lighter touch.
Excessive vibration when turning larger workpieces or bowls.	1. Headstock and/or tailstock improperly located at ends of workpiece. 2. Workpiece is unbalanced.	1. Check for proper workpiece centers. 2. Cut off stock until workpiece is balanced.
Lathe will not turn on.	1. Speed control lever not in its lowest speed setting. 2. Electrical outlet not working or is of wrong voltage. 3. Blown fuse or tripped circuit breaker.	1. Turn speed control lever to its lowest speed setting. 2. Plug lathe into a working, 220 volt, grounded, electrical outlet. 3. Replace fuse or reset circuit breaker.
Lathe will not turn off.	Damaged or faulty power switch and/or internal wiring.	Unplug the lathe from its electrical outlet immediately. Do not operate lathe until it is repaired by a qualified service technician.

PLEASE READ THE FOLLOWING CAREFULLY

THE MANUFACTURER AND/OR DISTRIBUTOR HAS PROVIDED THE PARTS LIST AND ASSEMBLY DIAGRAM IN THIS MANUAL AS A REFERENCE TOOL ONLY. NEITHER THE MANUFACTURER OR DISTRIBUTOR MAKES ANY REPRESENTATION OR WARRANTY OF ANY KIND TO THE BUYER THAT HE OR SHE IS QUALIFIED TO MAKE ANY REPAIRS TO THE PRODUCT, OR THAT HE OR SHE IS QUALIFIED TO REPLACE ANY PARTS OF THE PRODUCT. IN FACT, THE MANUFACTURER AND/OR DISTRIBUTOR EXPRESSLY STATES THAT ALL REPAIRS AND PARTS REPLACEMENTS SHOULD BE UNDERTAKEN BY CERTIFIED AND LICENSED TECHNICIANS, AND NOT BY THE BUYER. THE BUYER ASSUMES ALL RISK AND LIABILITY ARISING OUT OF HIS OR HER REPAIRS TO THE ORIGINAL PRODUCT OR REPLACEMENT PARTS THERETO, OR ARISING OUT OF HIS OR HER INSTALLATION OF REPLACEMENT PARTS THERETO.

Record Product's Serial Number Here:

Note: If product has no serial number, record month and year of purchase instead.

Note: Some parts are listed and shown for illustration purposes only, and are not available individually as replacement parts.

PARTS LISTS AND DIAGRAMS

PARTS LIST A - HEAD STOCK

Note: When **ordering parts from the following lists, indicate the *part name and part number with the suffix of the lit it is on.*** (Example: **"Screw, Part #1A.")**

Part	Description	Qty.
1A	Screw (M8 x 25)	4
2A	Cover	1
3A	Oil Seal (0.5mm)	1
4A	Spindle	1
5A	Bearing (7212)	1
6A	Key (8 x 82)	1
7A	Key (8 x 45)	1
8A	Screw (M3 x 8)	2
9A	Gear	1
10A	Gear	1
11A	Gear	1
12A	Nut	1
13A	Washer	2
14A	Screw (M8 x 8)	2
15A	Collar	1
16A	Screw (M8 x 8)	1
17A	Gear	1
18A	Bearing (7211)	1
19A	Nut	2
20A	Oil Seal (0.5mm)	1
21A	Cover	11
22A	Screw (M8 x 16)	4
23A	Screw (M8 x 16)	5
24A	Cover	1
25A	Oil Seal (0.5mm)	1
26A	Bearing (60304)	1
27A	Shaft	1
28A	Key (8 x180)	1
29A	Screw (M3 x 8)	2
30A	Gear	1

Part	Description	Qty.
31A	Gear	1
32A	Gear	1
33A	Screw (M5 x 6)	4
33-1A	Key (5 x 20)	2
34A	Gear	1
35A	Gear	1
36A	Gear	1
37A	Bearing (60104)	1
38A	Oil Seal (0.5mm)	1
39A	Cover	1
40A	Screw (M8 x 20)	1
41A	Washer	1
42A	Pulley	1
43A	Screw (M6 x 12)	4
44A	Cover	1
45A	Oil Seal (0.5mm)	1
46A	Gear	1
47A	Gear	1
48A	Gear	1
49A	Arbor Shaft	1
50A	Key (5 x 30)	1
51A	Key (5 x 80)	1
52A	Bearing (104)	1
53A	Screw (M6 x 12)	2
54A	Washer	2
55A	Gear	2
56A	Key (5 x 8)	1
57A	Oil Seal (PD20 x 45 x 10)	1
58A	Circlip (#20)	1
59A	Circlip (#42)	1

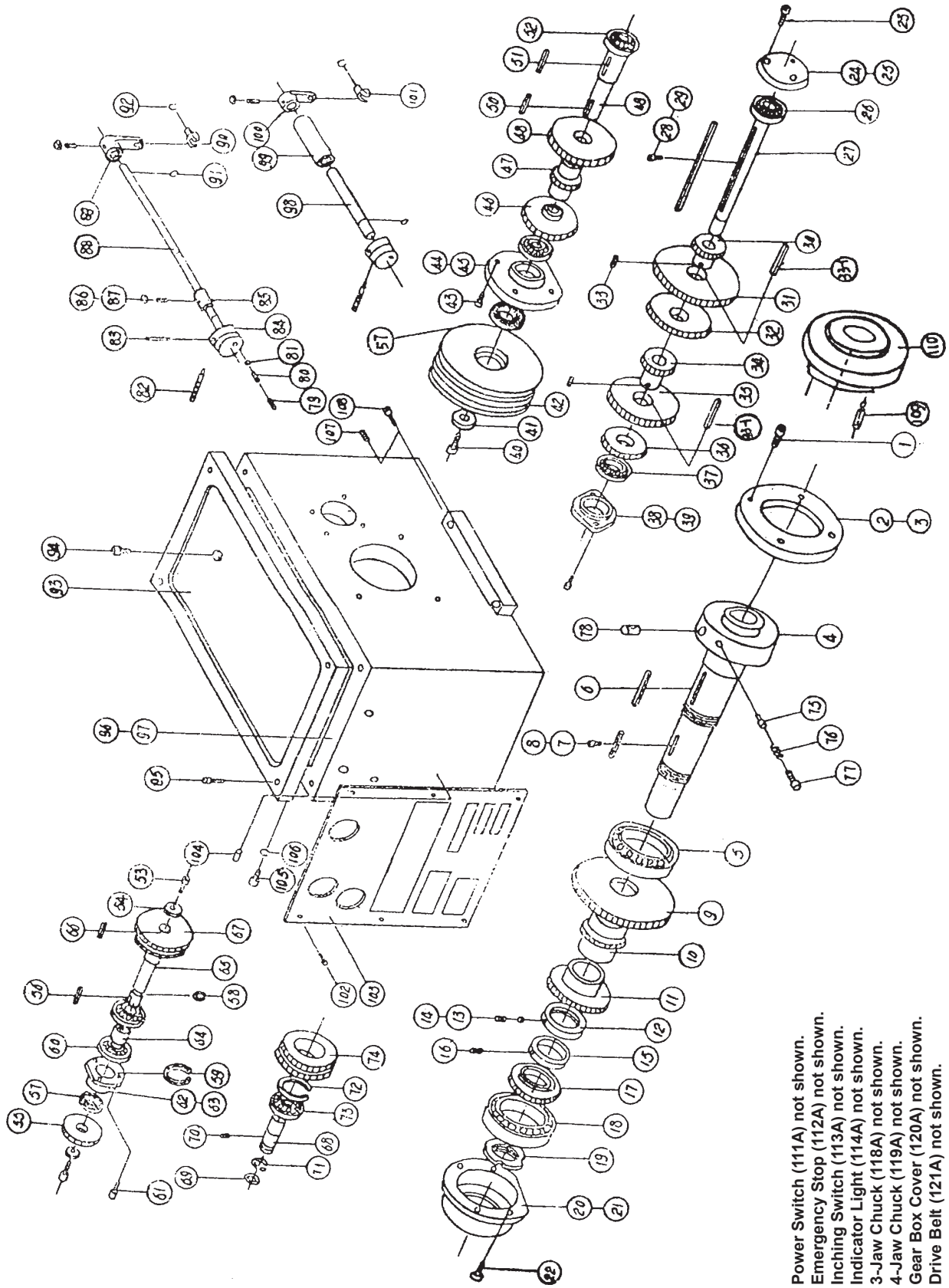
PARTS LIST A - HEAD STOCK (cont.)

Part	Description	Qty.
60A	Bearing (104)	1
61A	Screw (M6 x 16)	2
62A	Oil Seal (0.5mm)	3
63A	Cover	1
64A	Collar	1
65A	Shaft	1
66A	Key (5 x 20)	1
67A	Gear	1
68A	Shaft	1
69A	Oil Seal (22 x 2.4)	1
70A	Screw (M8 x 6)	1
71A	Circlip (#20)	1
72A	Circlip (#47)	2
73A	Bearing (204)	1
74A	Gear	1
75A	Lock Pin	3
76A	Spring	3
77A	Screw (M8 x 16)	3
78A	Eccentric Shaft	3
79A	Screw (M8 x 8)	6
80A	Spring	6
81A	Ball (#6)	6
82A	Handle	3
83A	Pin (5 x 40)	3
84A	Boss	3
85A	Collar	1
86A	Nut (M8)	6
87A	Screw (M8 x 12)	6
88A	Shaft	2
89A	Speed Control (A, B)	2
90A	Shifter	2
91A	Oil Seal (16 x 2.4)	5

Part	Description	Qty.
92A	Circlip (#2)	3
93A	Cover	1
94A	Screw	1
95A	Screw (M6 x 25)	6
96A	Oil Seal (0.5mm)	1
97A	Headstock	1
98A	Shaft	1
99A	Collar	1
100A	Direction Control	1
101A	Shifter	1
102A	Rivet (2 x 6)	6
103A	Sign Board	1
104A	Oil Window	1
105A	Screw	1
106A	Oil Seal (14 x 24)	1
107A	Screw (M8 x 30)	2
108A	Screw (M8 x 35)	2
109A	Rod	9
110-1A	Face Plate	1
110-2A	3-Jaw Chuck Flange	1
110-3A	4-Jaw Chuck Flange	1
111A	Power Switch	1
112A	Emergency Stop	1
113A	Inching Switch	1
114A	Indicator Light	1
115A	Feed Gear Lever*	1
116A	Feed Gear Lever*	1
117A	Thread/Feed Selector*	1
118A	3-Jaw Chuck	1
119A	4-Jaw Chuck	1
120A	Gear Box Cover	1
121A	Drive Belt	1

* Part of SKU 66164 only.

ASSEMBLY DIAGRAM A - HEAD STOCK

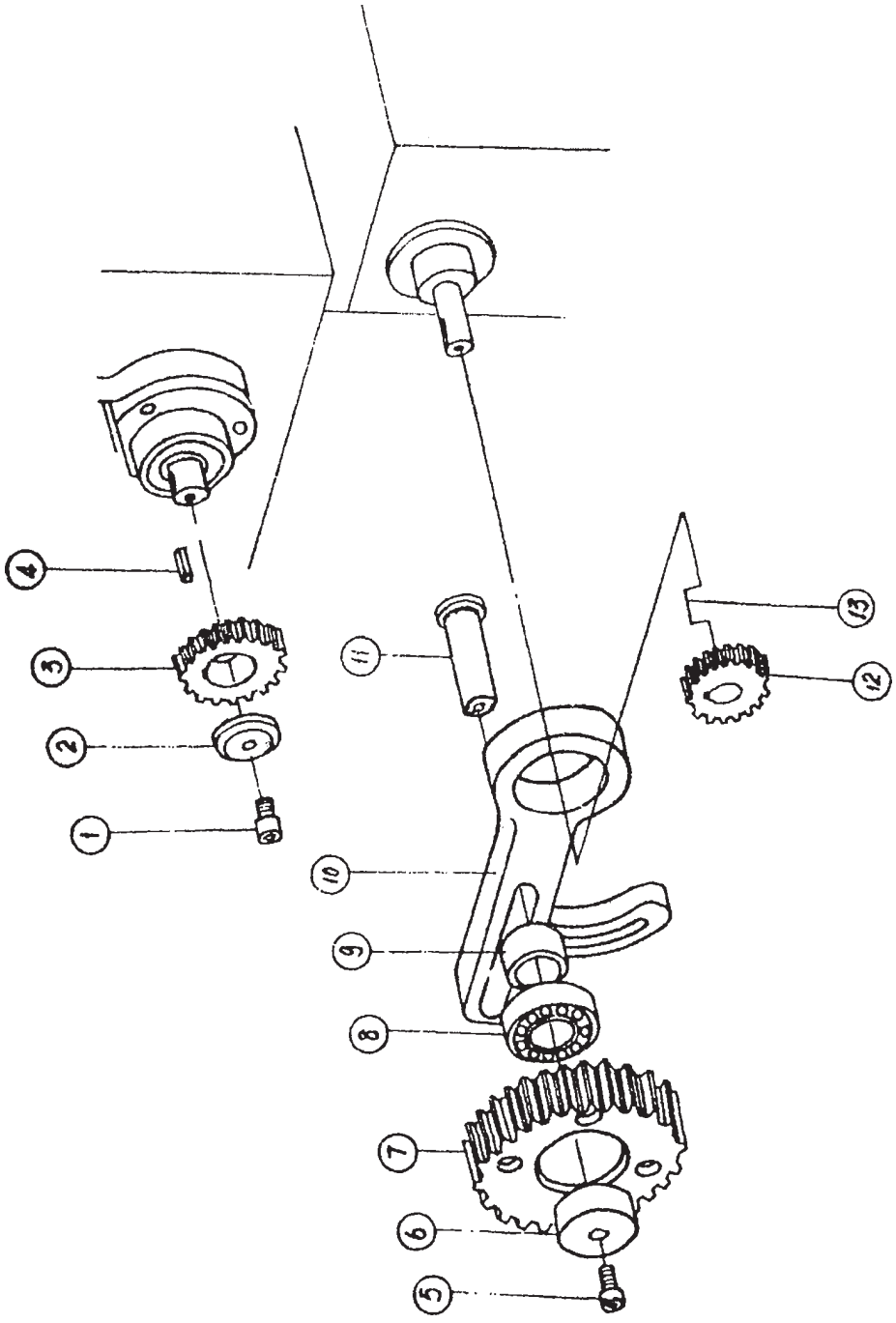


Power Switch (111A) not shown.
Emergency Stop (112A) not shown.
Inching Switch (113A) not shown.
Indicator Light (114A) not shown.
3-Jaw Chuck (118A) not shown.
4-Jaw Chuck (119A) not shown.
Gear Box Cover (120A) not shown.
Drive Belt (121A) not shown.

PARTS LIST AND ASSEMBLY DIAGRAM B - CHANGE GEAR

Part	Description	Qty.
1B	Screw (M6 x 12)	1
2B	Washer	1
3B	Gear	1
4B	Key (5 x 8)	1
5B	Screw (M6 x 12)	1
6B	Washer	1
7B	Gear	1

Part	Description	Qty.
8B	Bearing (80202)	1
9B	Collar	1
10B	Quadrant	1
11B	Shaft	1
12B	Gear	1
13B	Key (A5 x 23)	1

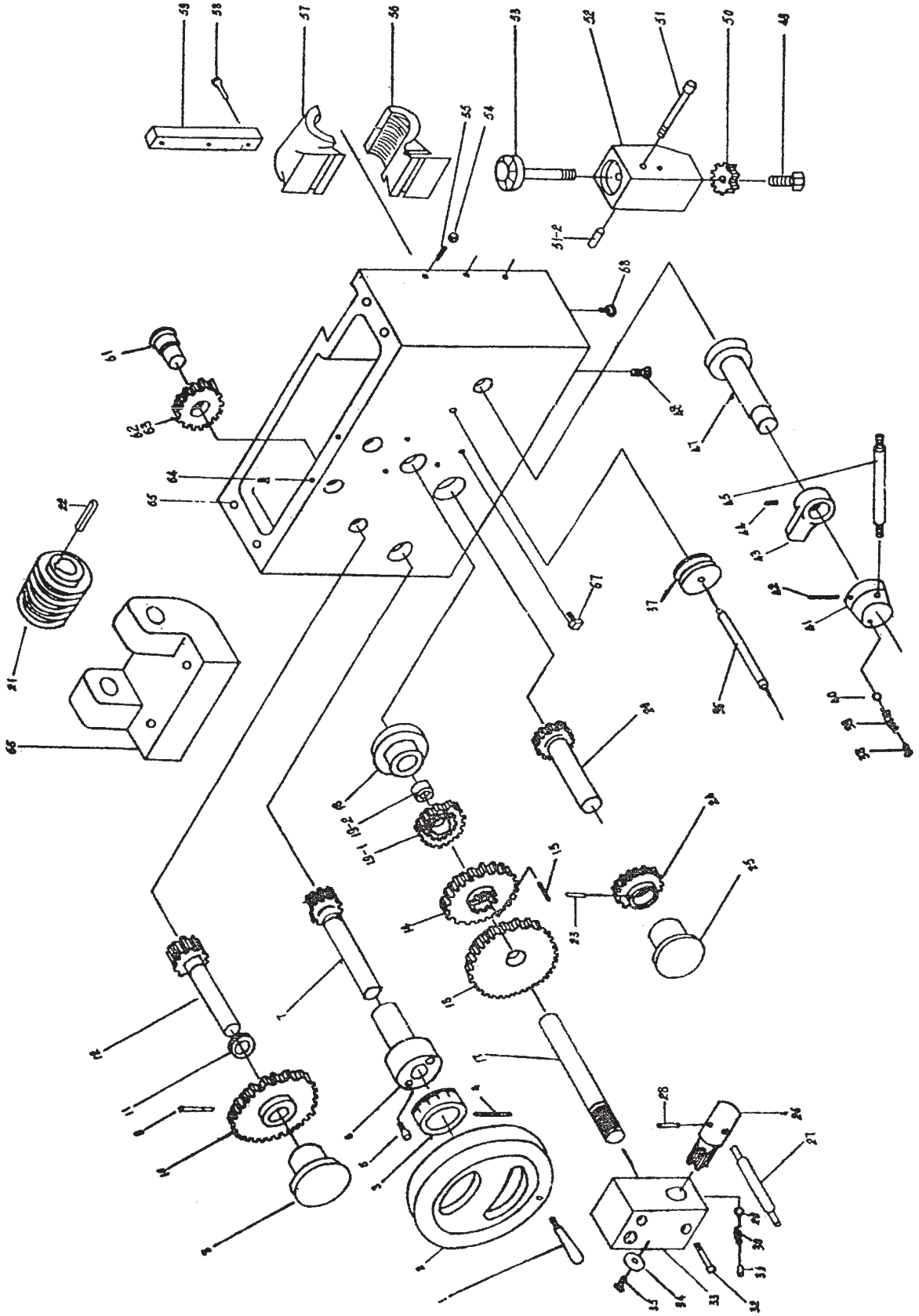


PARTS LIST C - APRON

Part	Description	Qty.
1C	Handle	1
2C	Hand Wheel	1
3C	Index Ring	1
4C	Pin (5 x 50)	1
5C	Screw (M6 x 20)	2
6C	Bracket	1
7C	Gear Shaft	1
8C	Bushing	1
9C	Pin (5 x 30)	1
10C	Gear	1
11C	Washer	2
12C	Gear Shaft	1
13C	Gear	1
14C	Gear	1
15C	Pin (5 x 33)	3
17C	Shaft	1
18C	Bushing	1
18-1C	Screw (M5 x 8)	2
19-1C	Gear	1
19-2C	Sleeve	2
20C	Shaft	1
20-1C	Worm Gear	1
20-2C	Screw (M6 x 6)	1
21C	Worm	1
22C	Flat Key (5 x 38)	1
23C	Pin (5 x 25)	1
24C	Gear	1
25C	Bushing	1
26C	Gear Shaft	1
27C	Feed Lever	1
28C	Pin (5 x 25)	1
29C	Ball (#6)	1
30C	Spring (6 x 1 x 16)	1
31C	Screw (M8 x 12)	1
32C	Screw (M6 x 45)	3
33C	Boss	1
34C	Washer	1

Part	Description	Qty.
35C	Screw (M6 x 12)	1
36C	Shaft	1
37C	Safety Shifter	1
38C	Screw (M8 x 8)	1
39C	Spring (6 x 1 x 16)	1
40C	Ball (#6)	1
41C	Boss	1
42C	Pin (5 x 40)	1
43C	Dog	1
44C	Screw (M5 x 8)	1
45C	Thread Lever	1
47C	Shaft	1
47-1C	Pin (5 x 10)	1
47-2C	Pin (4 x 30)	1
47-3C	Screw (M5 x 6)	2
48C	Screw (M8 x 35)	2
49C	Screw (M6 x 16)	1
50C	Gear	1
51-1C	Screw (M6 x 65)	1
52C	Housing	1
51-2C	Sleeve	1
53C	Thread Cutting Dial	1
54C	Nut (M6)	3
55C	Screw (M6 x 12)	3
56C	Half Nut	1
57C	Half Nut	1
58C	Screw (M6 x 25)	1
59C	Gib	1
61C	Shaft	1
62C	Gear	1
63C	Bushing	1
64C	Screw (M6 x 6)	1
65C	Apron Case	1
66C	Worm Frame	1
67C	Limit Block	1
68C	Screw	2

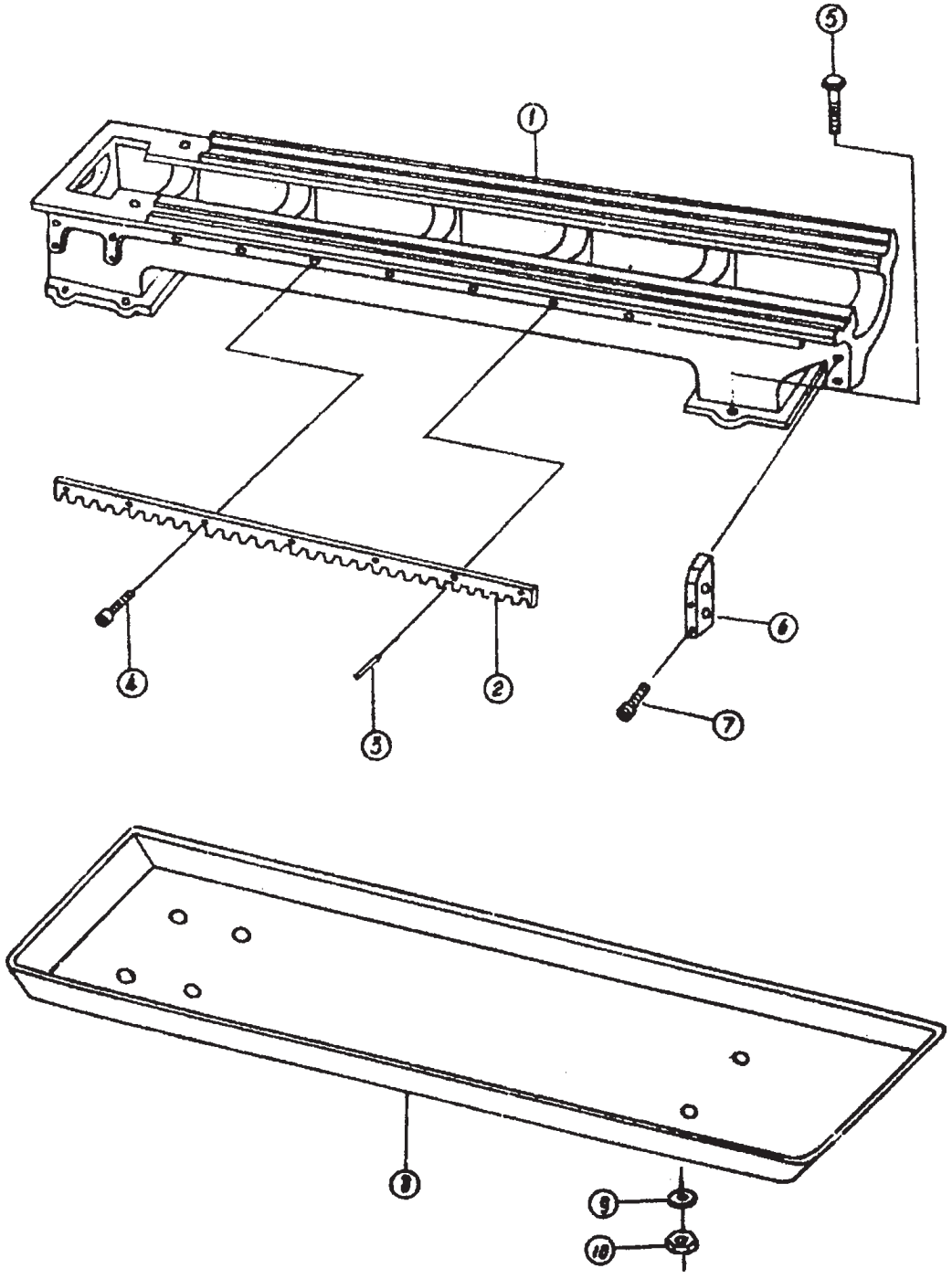
ASSEMBLY DIAGRAM C - APRON



PARTS LIST AND ASSEMBLY DIAGRAM D - BED

Part	Description	Qty.
1D	Lathe Bed	1
2D	Rack Gear	1
3D	Pin	6
4D	Screw	6
5D	Screw	6

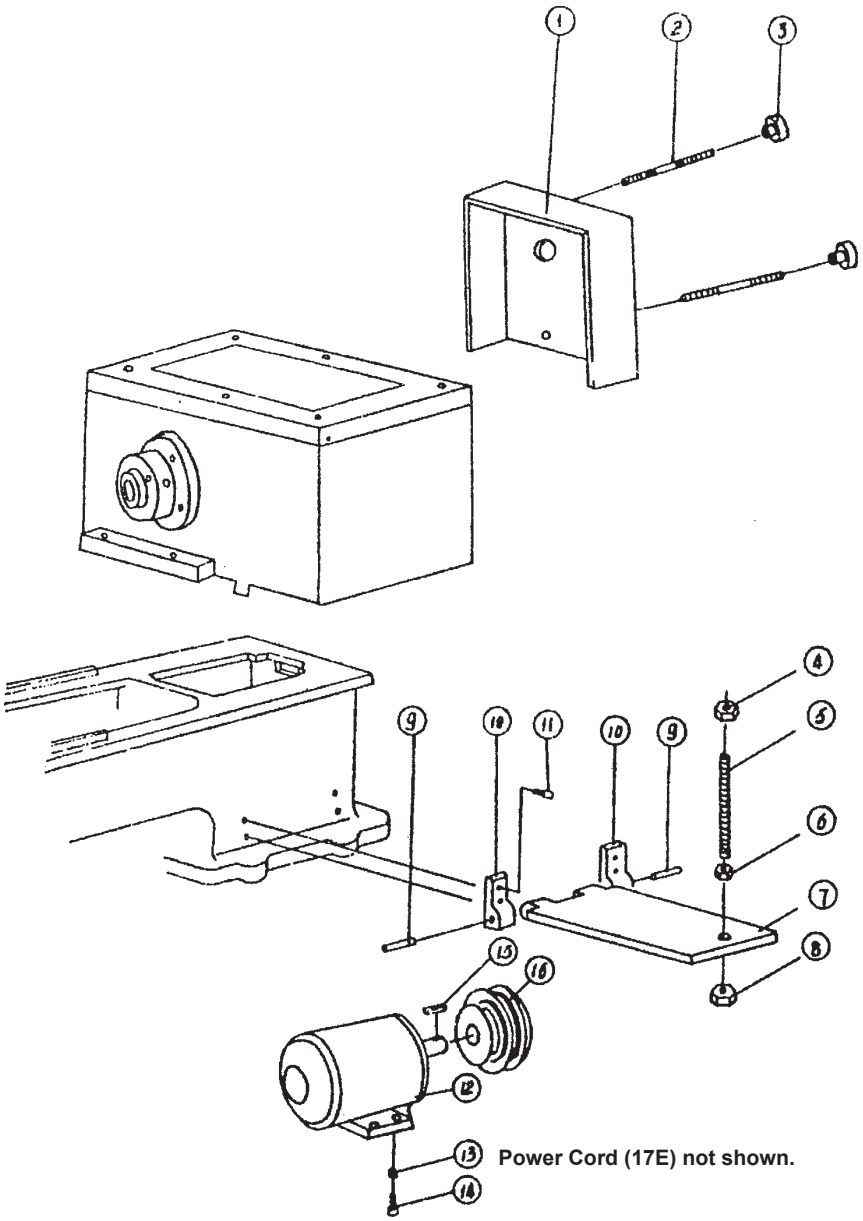
Part	Description	Qty.
6D	Bracket	1
7D	Screw	2
8D	Chip Pan	1
9D	Washer	6
10D	Nut	6



PARTS LIST AND ASSEMBLY DIAGRAM E - BED & DRIVE

Part	Description	Qty.
1E	Cover	1
2E	Screw	2
3E	Nut	2
4E	Nut (M10)	1
5E	Screw	1
6E	Nut (M12)	2
7E	Plate	1
8E	Washer (#12)	2
9E	Shaft	2

Part	Description	Qty.
10E	Bracket	2
11E	Screw (M8 x 25)	4
12E	Motor (1.1Kw)	1
13E	Nut (M10)	4
13-1E	Washer (#10)	1
14E	Screw (M10 x 40)	4
15E	Key (8 x 40)	1
16E	Pulley	1
17E	Power Cord	1

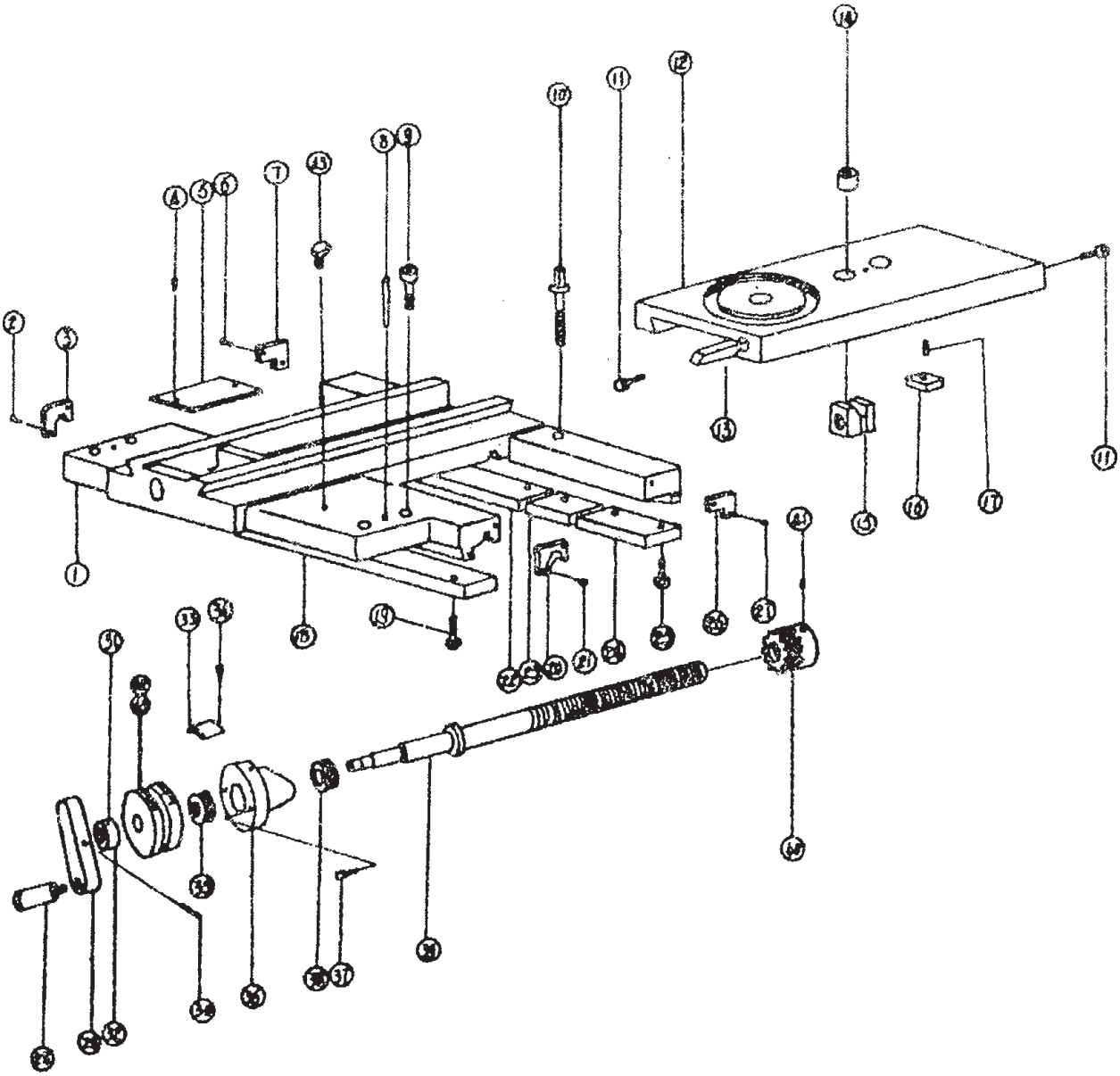


PARTS LIST F - SADDLE

Part	Description	Qty.
1F	Saddle	1
2F	Screw M5 x 10)	2
3F	Wiper	1
4F	Screw (M5 x 5)	2
5F	Cover	1
6F	Screw (M5 x 5)	2
7F	Wiper	2
8F	Pin (5 x 45)	2
9F	Screw (M10 x 30)	4
10F	Screw	1
11F	Screw	2
12F	Tool Post Slide	1
13F	Saddle Lock Screw	1
14F	Bushing	2
14-1F	Screw (M6 x 16)	2
15F	Nut	2
16F	Wedge Adjuster	1
17F	Screw (M6 x 16)	1
18F	Slide Plate	1
19F	Screw (M8 x 25)	2
20F	Wiper	1
21F	Screw (M5 x 10)	1

Part	Description	Qty.
22F	Slide Plate	1
23F	Slide Plate	1
24F	Slide Plate	1
25F	Screw (M8 x 25)	4
27F	Screw (M5 x 10)	2
28F	Cross Feed Crank	1
29F	Bracket	1
30F	Pin (4 x 20)	1
31F	Screw (M6 x 6)	1
31-1F	Washer	1
32F	Nut	1
33F	Signboard	1
34F	Rivet (2 x 6)	2
35F	Bearing (8102)	1
36F	Bracket	1
37F	Screw (M6 x 30)	1
38F	Bearing (8102)	2
39F	Screw	1
40F	Gear	1
41F	Screw (M6 x 6)	1
42F	Dial	1
43F	Screw	1

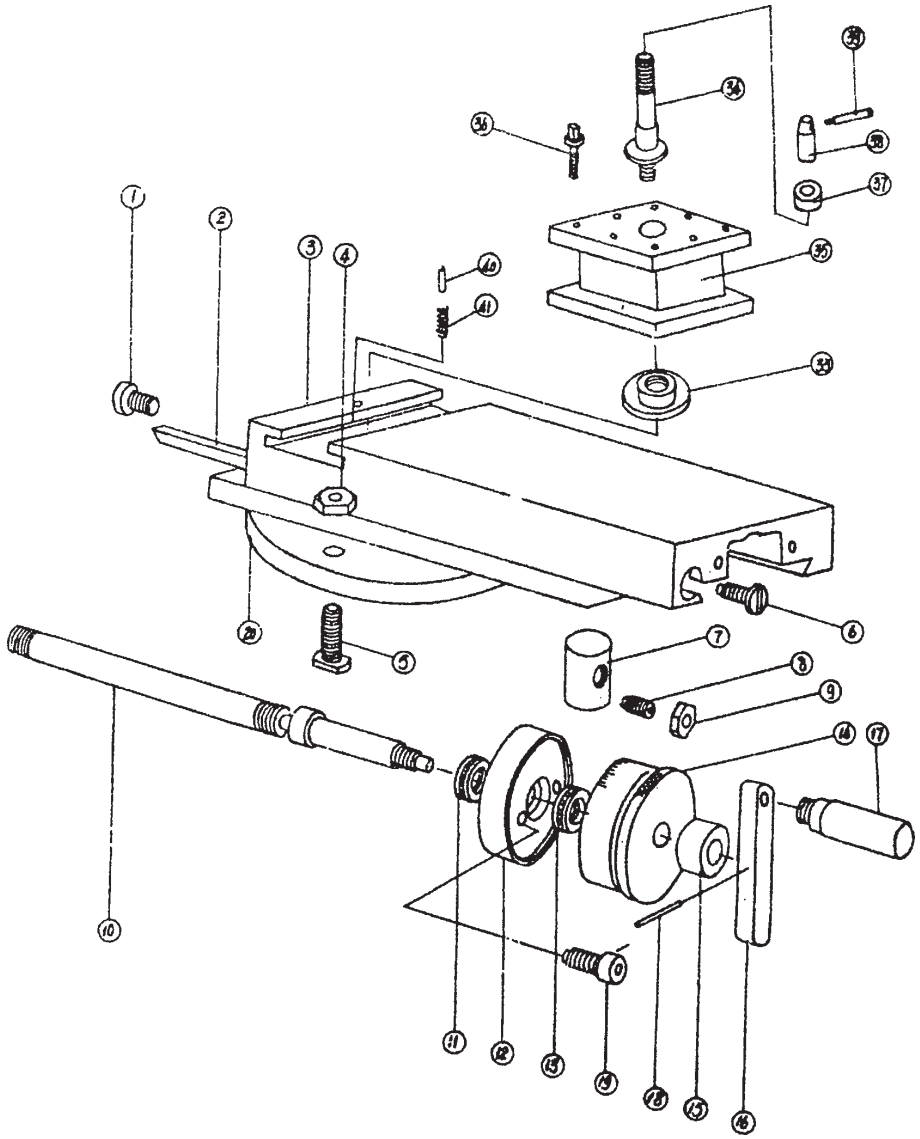
ASSEMBLY DIAGRAM F - SADDLE



PARTS LIST AND ASSEMBLY DIAGRAM G - TOOL POST

Part	Description	Qty.
1G	Screw	1
2G	Gib	1
3G	Compound Slide	1
4G	Nut (M10)	2
5G	Screw	2
6G	Screw	1
7G	Nut	1
8G	Screw (M6 x 12)	1
9G	Nut (M6)	1
10G	Screw	1
11G	Bearing (8101)	1
12G	Bracket	1
13G	Bearing (8101)	1
14G	Index Ring	1
15G	Nut	1

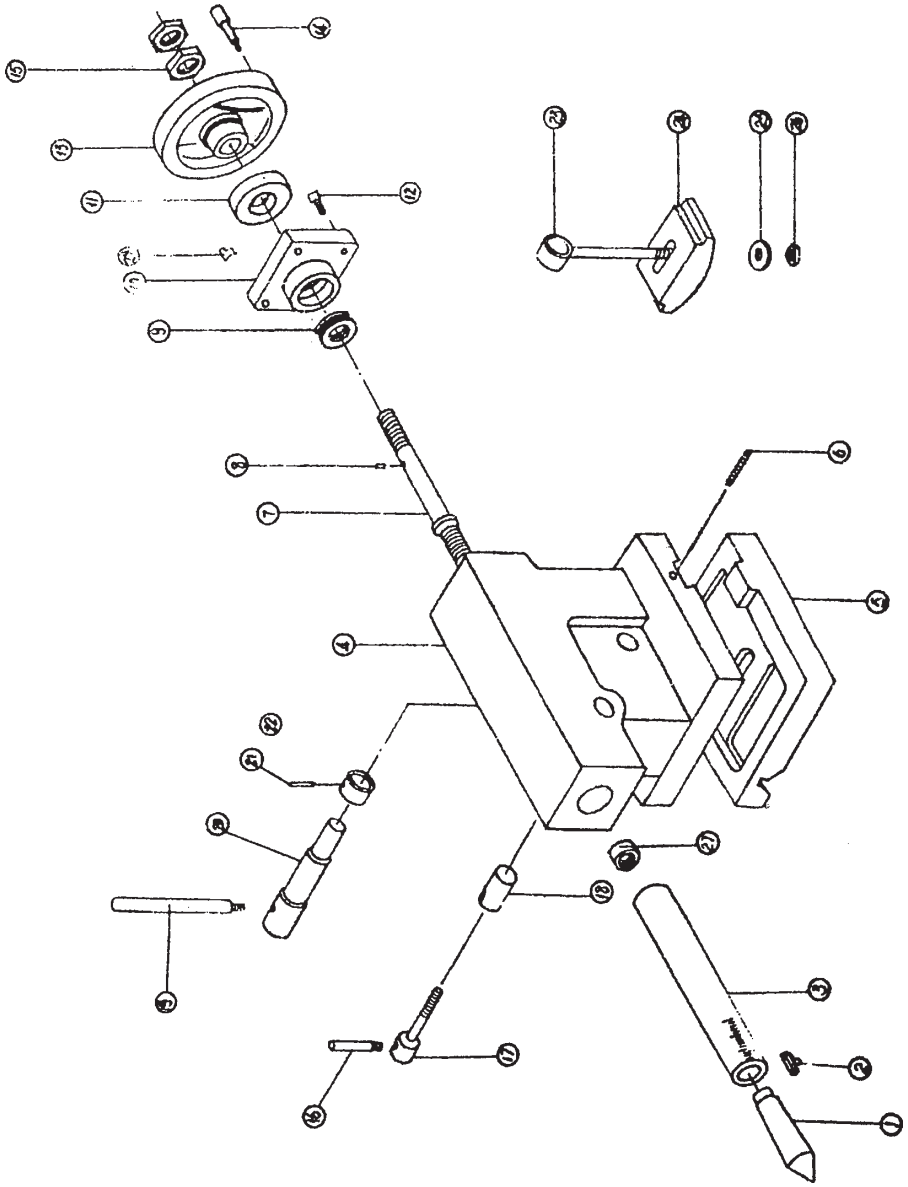
Part	Description	Qty.
16G	Bracket	1
17G	Compound Slide Crank	1
18G	Pin (3 x 16)	1
19G	Screw (M6 x 25)	1
20G	Compound Rest	1
33G	Nut	1
34G	Shaft	1
35G	Tool Post	1
36G	Screw	8
37G	Collar	1
38G	Boss	1
39G	Clamp Lever	1
40G	Pin	1
41G	Spring	1



PARTS LIST AND ASSEMBLY DIAGRAM H - TAILSTOCK

Part	Description	Qty.
1H	Center	1
2H	Key	1
3H	Quill	1
4H	Tailstock	1
5H	Base	1
6H	Set Screw	2
7H	Screw	1
8H	Pin (4 x 8)	1
9H	Bearing (8101)	1
10H	Bracket	1
11H	Index Ring	1
12H	Screw (M6 x 20)	4
13H	Hand Wheel	1
14H	Handle	1

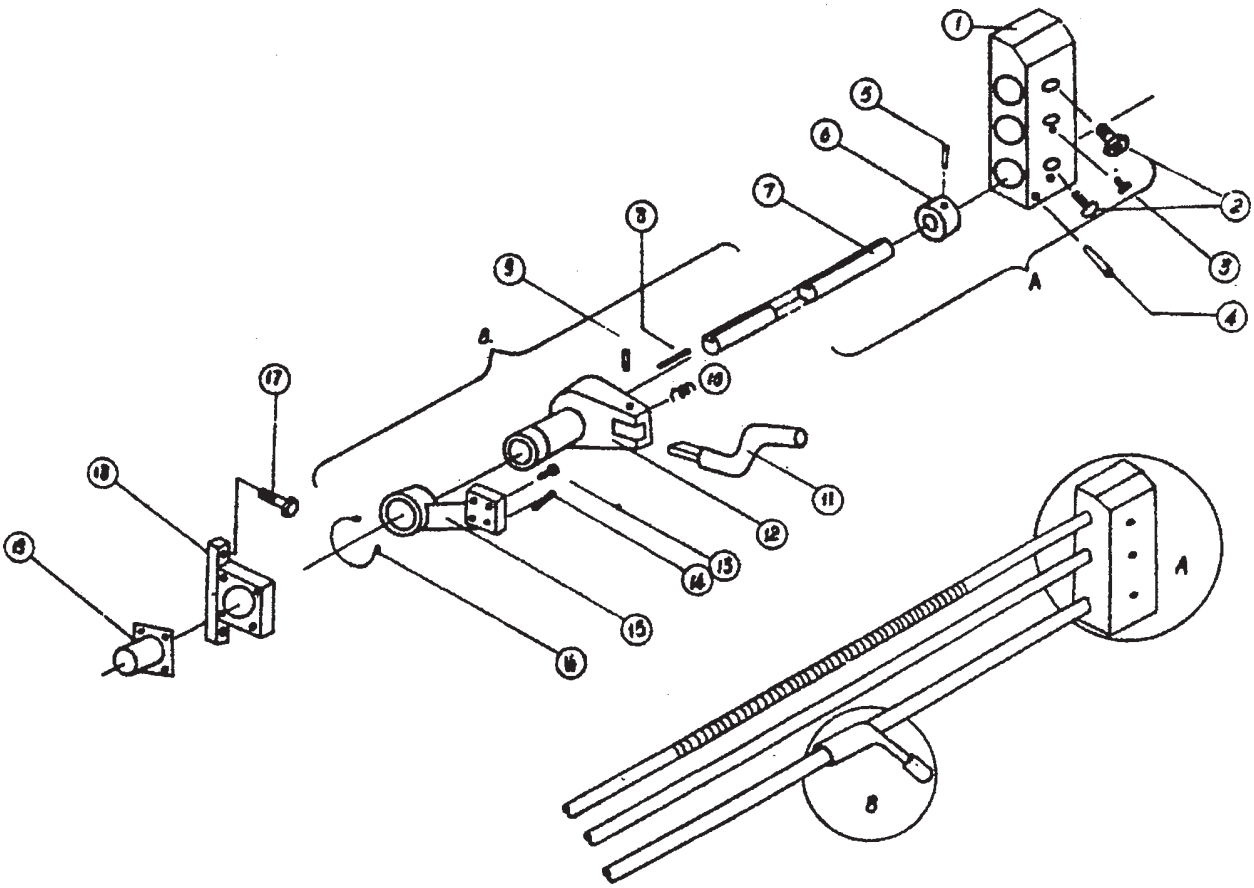
Part	Description	Qty.
15H	Nut (M10)	2
16H	Handle	1
17H	Lock Screw	1
18H	Lock Screw	1
19H	Handle	1
20H	Shaft	1
21H	Pin (5 x 30)	1
22H	Collar	1
23H	Shaft	1
24H	Shoe Block	1
25H	Washer (#12)	1
26H	Nut (M12)	1
27H	Nut	1
28H	Index Piece	1



PARTS LIST AND ASSEMBLY DIAGRAM I - CONTROL SWITCH

Part	Description	Qty.
1I	Bracket	1
2I	Screw (M10 x 60)	2
3I	Oil Cup	2
4I	Pin (6 x 55)	2
5I	Pin (4 x 30)	1
6I	Collar	1
7I	Rod	1
8I	Key (5 x 38)	1
9I	Pin (4 x 20)	1
10I	Spring	1

Part	Description	Qty.
11I	Starting Handle	1
12I	Bracket	1
13I	Screw (M6 x 20)	2
14I	Pin (5 x 20)	2
15I	Bracket	1
16I	Circlip (#32)	1
17I	Screw (M8 x 25)	1
18I	Bracket	1
19I	Switch	1

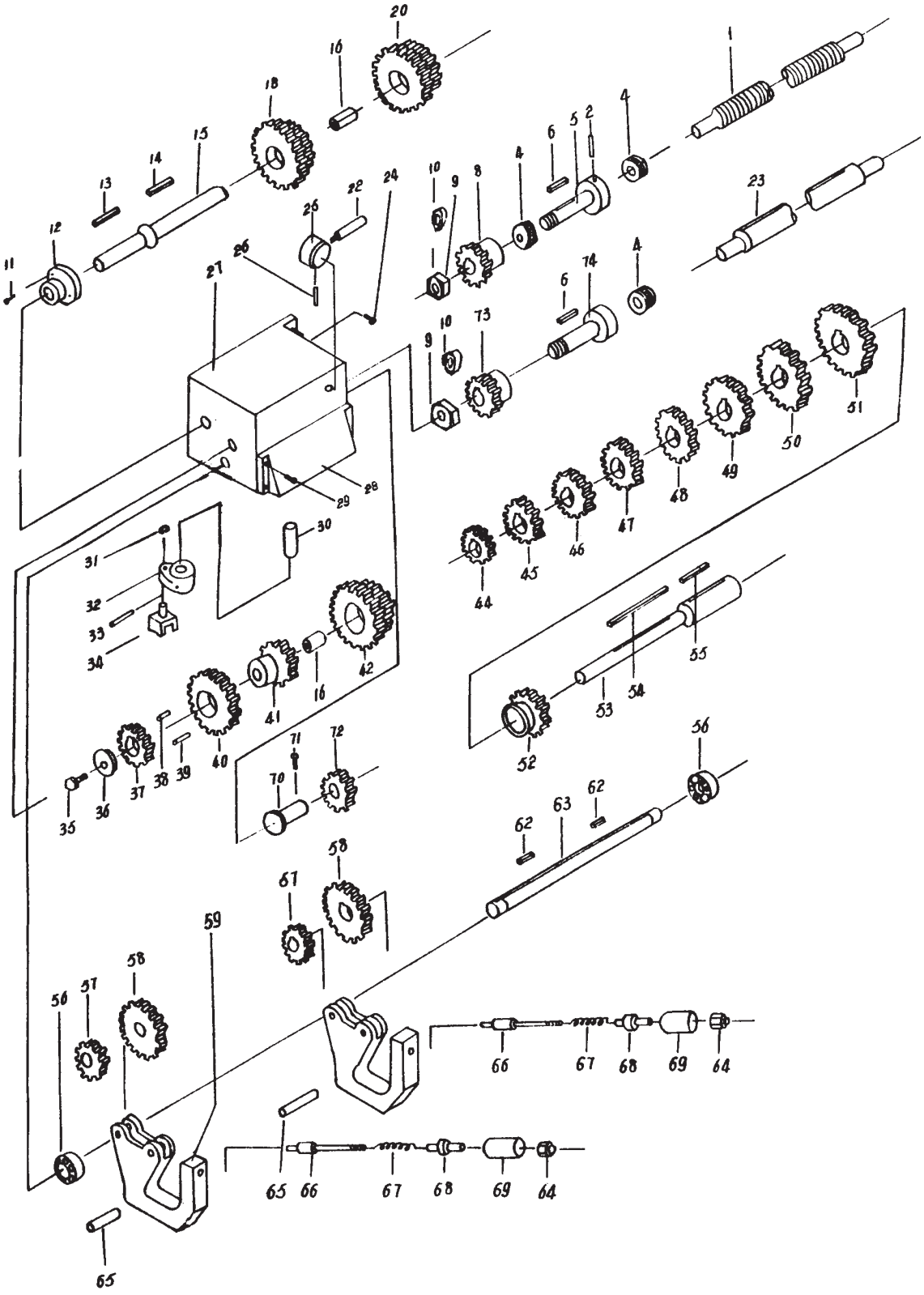


PARTS LIST J - 65044 GEARBOX

Part	Description	Qty.
1J	Lead Screw	1
2J	Pin 5 x 35	2
4J	Bearing	3
5J	Shaft	1
6J	Key 5x15	2
8J	Gear	1
9J	Nut M12	4
10J	Washer	2
11J	Screw M6 x 16	3
12J	Cover	1
13J	Key 5 x 23	1
14J	Key 5 x 9	1
15J	Shaft	1
16J	Bushing	2
18J	Gear	1
20J	Gear	1
22J	Lever	1
23J	Feed Rod	1
24J	Screw M10 x 30	2
25J	Boss	1
26J	Pin 5 X 40	1
27J	Gearbox Housing	1
28J	Plate	1
29J	Screw M6 x 16	4
30J	Shaft	1
31J	C-clip 12	1
32J	Shift Pivot	1
33J	Pin 4 x 30	1
34J	Shift Yoke	1
35J	Screw M6 x 12	1
36J	Washer	1
37J	Gear (sleeve)	1
38J	Pin 3 x 3	1
39J	Pin 3 x 3	1

Part	Description	Qty.
40J	Gear	1
41J	Gear	1
42J	Gear	2
44J	Gear	1
45J	Gear	1
46J	Gear	1
47J	Gear	1
48J	Gear	1
49J	Gear	1
50J	Gear	1
51J	Gear	1
52J	Gear	1
53J	Shaft	1
54J	Key 5 x 75	1
55J	Key	1
56J	Bearing 7000102	2
57J	Gear	2
58J	Gear	2
59J	Shift Lever	2
62J	Key	2
63J	Shaft	1
64J	Nut	2
65J	Shaft	2
66J	Shaft	2
67J	Spring	2
68J	Sleeve	2
69J	Housing	2
70J	Shaft	1
71J	Screw M8 x 8	2
71-1J	Pin	1
72J	Gear	1
73J	Gear	1
74J	Shaft	1

ASSEMBLY DIAGRAM J - 65044 GEARBOX



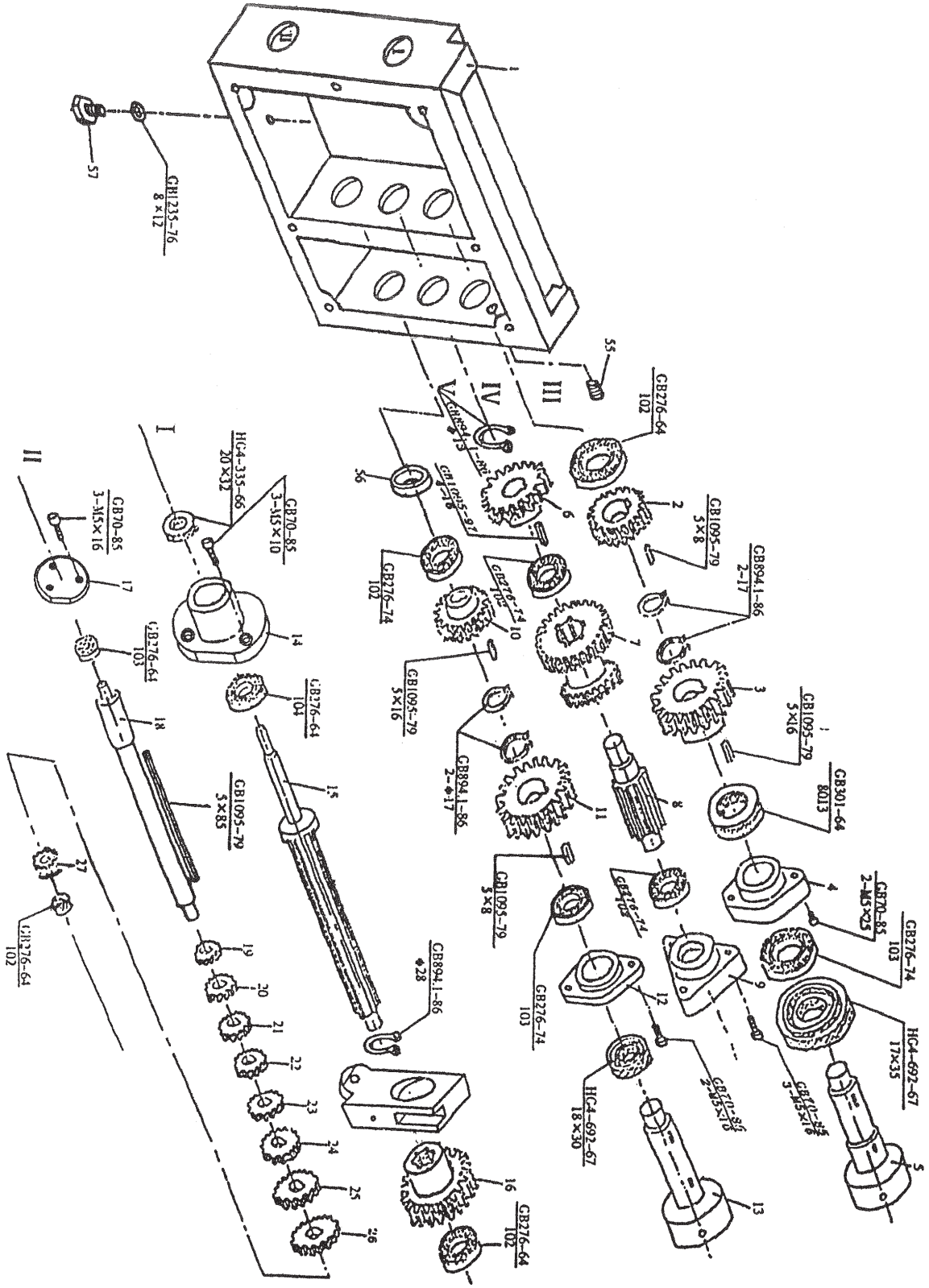
PARTS LIST K - 66164 GEARBOX

Part	Description	Qty.
1K	Gearbox	1
2K	Gear	1
3K	Gear	1
4K	Cover	1
5K	Shaft	1
6K	Gear	1
7K	Gear	1
8K	Shaft	1
9K	Cover	1
10K	Gear	1
11K	Gear	1
12K	Cover	1
13K	Shaft	1
14K	Cover	1
15K	Shaft	1
16K	Gear	1
17K	Cover	1
18K	Shaft	1
19K	Gear	1
20K	Gear	1
21K	Gear	1
22K	Gear	1
23K	Gear	1
24K	Gear	1
25K	Gear	1
26K	Gear	1
27K	Gear	1
28K	Plate	1
29K	Plate	1
30K	Live	1
31K	Lever	1

Part	Description	Qty.
32K	Support	1
33K	Lever	1
34K	Support	1
35K	Cover	1
36K	Shaft	1
37K	Handle	1
38K	Indexing Plate	1
39K	Shaft	1
40K	Collar	1
41K	Handle	1
42K	Indexing Plate	1
43K	Rod	1
44K	Collar	1
45K	Shaft	1
46K	Range Selector	1
47K	Rod	1
48K	Lever	1
49K	Handle	1
50K	Pin	1
51K	Crank	1
52K	Shaft	1
53K	Gear	1
54K	Shaft	1
55K	Screw	1
56K	Collar	1
57K	Screw	1
58K	Spring	4
59K	Springboard	1

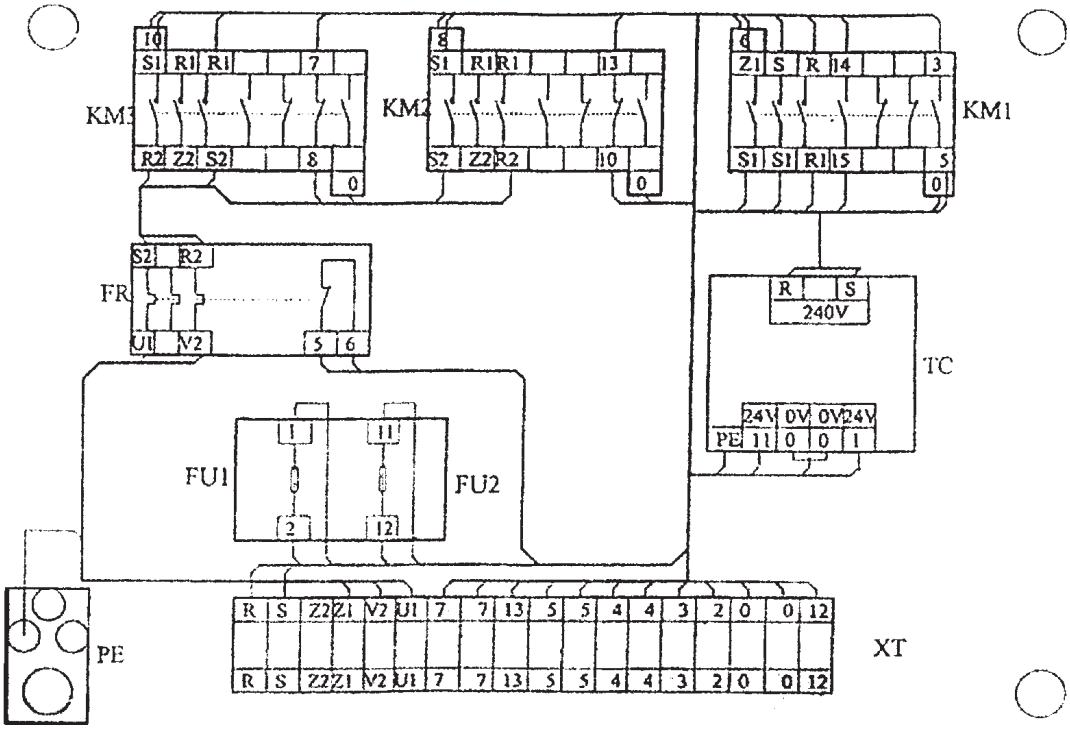
Note: Some parts need to be ordered using the codes shown on the diagram instead of these part numbers.

ASSEMBLY DIAGRAM K - 66164 GEARBOX

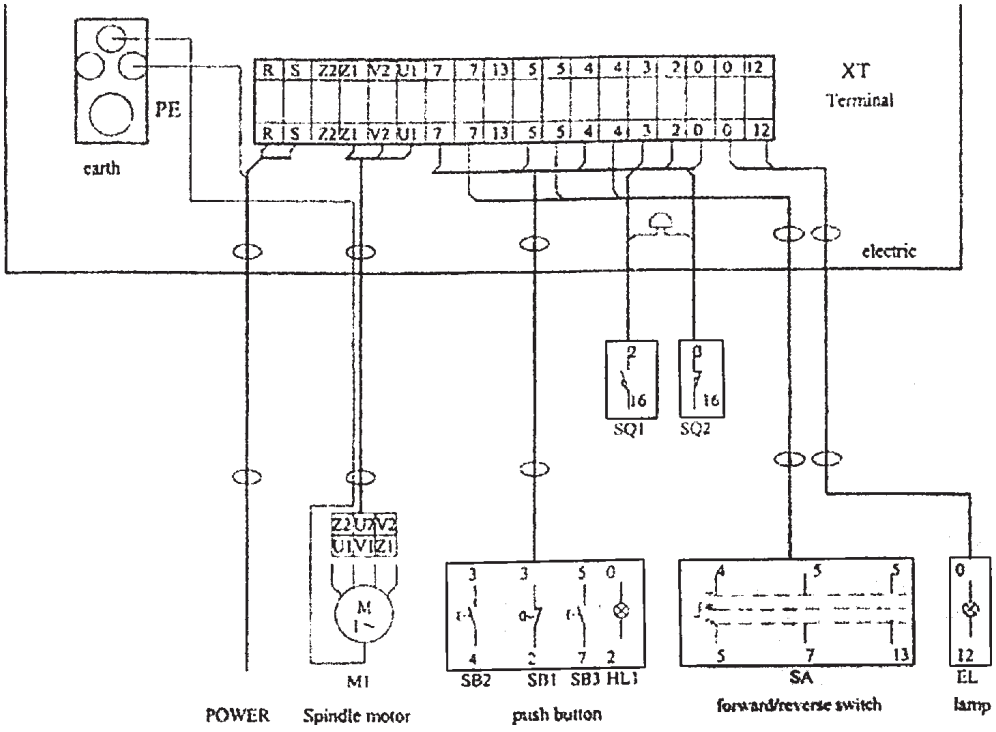


WIRING DIAGRAMS

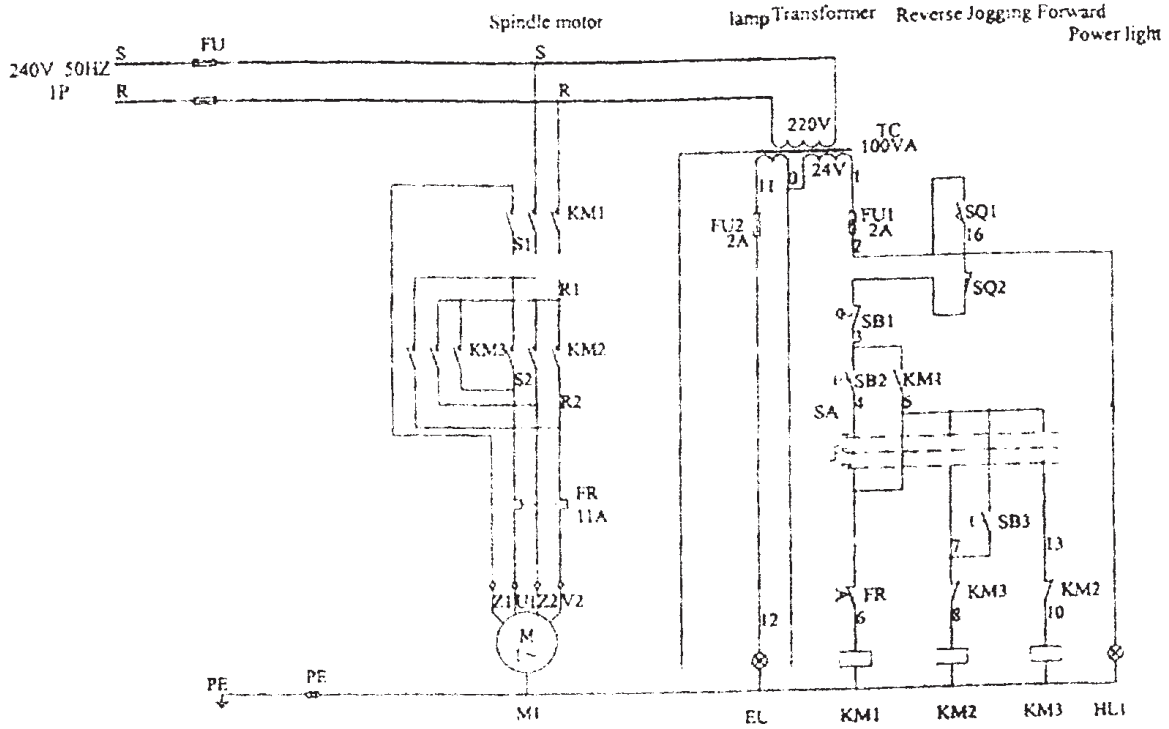
ELECTRIC PANEL CONNECTION



CONNECTION BETWEEN ELECTRIC PANEL & OUTSIDE COMPONENTS



ELECTRICAL SCHEMATIC



LIMITED 1 YEAR / 90 DAY WARRANTY

Harbor Freight Tools Co. makes every effort to assure that its products meet high quality and durability standards, and warrants to the original purchaser that for a period of ninety days from date of purchase that the engine/motor, the belts (if so equipped), and the blades (if so equipped) are free of defects in materials and workmanship. Harbor Freight Tools also warrants to the original purchaser, for a period of one year from date of purchase, that all other parts and components of the product are free from defects in materials and workmanship (90 days if used by a professional contractor or if used as rental equipment). This warranty does not apply to damage due directly or indirectly, to misuse, abuse, negligence or accidents, repairs or alterations outside our facilities, normal wear and tear, or to lack of maintenance. We shall in no event be liable for death, injuries to persons or property, or for incidental, contingent, special or consequential damages arising from the use of our product. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation of exclusion may not apply to you. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

To take advantage of this warranty, the product or part must be returned to us with transportation charges prepaid. Proof of purchase date and an explanation of the complaint must accompany the merchandise. If our inspection verifies the defect, we will either repair or replace the product at our election or we may elect to refund the purchase price if we cannot readily and quickly provide you with a replacement. We will return repaired products at our expense, but if we determine there is no defect, or that the defect resulted from causes not within the scope of our warranty, then you must bear the cost of returning the product.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

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